



Substation & Protective Equipment

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Transformer Loading

- Loss of Life Calculations
 - Are ANSI standards still applicable?
- Optimum Loading level?
 - Planning issue / can upgrade be deferred?
 - End use load control / alternate technologies
- Spares issue

Protective Systems & SCADA

- Aging workforce
- Plug & Play not meeting expectations
- Need for simplicity
- Life Cycle of new digital equipment

Aging Workforce

- Experts on older electro-mechanical relays will be retiring
- Newer employees – trained digital
- Accelerate change over to digital

Plug & Play SCADA

- Connectors not compatible
- Time Consuming installation
- Copper => Fiber

Simplicity

- Improved software
- Easy to learn & program
- Standardization

Life Cycle of Digital Equipment

- How long will it last?
- Will we get vendor support?
- Will new software work with older gear?

Overall Impact

- If changes were made to meet these concerns, how much impact would it make to improve the overall transfer capability and reliability of the electric grid?
 - Minimal improvement.

Overall Impact continued

- What are the biggest obstacles to improving the overall transfer capability and reliability of the grid?
 - Common State & Federal vision
 - Resolve the “who pays for transmission” issue
 - Permitting/routing/siting
 - Build lines